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ABSTRACT

The purpose of this study was to gather descriptive data for a comparative analysis of classroom and physical education teaching. A description is provided of the instrument used in collecting a wide range of data appropriate to both the classroom and the gymnasium. Four behavioral categories were observed: substantive behavior, appraisal behavior, managerial behavior, and instructionally nonfunctional behaviors (behaviors that apparently serve no subtantive, managerial, or appraisal functions). Three classroom teachers and three physical education teachers were observed in their respective teaching situations. Results indicated that physical education teachers behave at twice the rate of classroom teachers in substantive and managerial functions. No practical differences appeared for appraisal and nonfunctional categories. Data reveal that physical education teachers showed higher rates of monitoring and initiating behavior, lower rates of soliciting behavior, and approximately the same rates of behavior for manipulating, responding, and clarifying behaviors. Following an analysis of the data, the implications for training physical education teachers are briefly discussed. (JD)

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COMPARISON OF SELECTED INSTRUCTIONAL FUNCTIONS FOR SECONDARY PHYSICAL EDUCATION AND CLASSROOM TEACHERS

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Comparison of Selected Instructional Functions
for Secondary Physical Education and
Classroom Teachers

INTRODUCTION

The purpose of this study was to gather descriptive data for a comparative analysis of classroom and physical education teaching. Although there has been some speculation concerning differences in the structure of teaching between these two settings, the lack of an equally applicable observation instrument for the two settings has prevented the acquisition of objective information. A thorough understanding of both settings leads to the conclusion that the typical classroom observation systems cannot be applied to physical education contexts (Rink, 1979).

The comparability of teaching functions in physical education and classroom contexts has practical significance for the design and conduct of teacher preparation programs for those who are preparing to be physical education teachers. If few significant differences exist, then little support is provided for the costly redundancy of separate preparation programs for physical education.

The Observational System for Instructional Analysis (OSIA-IV), developed and revised by Hough, et. al., (1975) was selected as an instrument capable of collecting a wide range of data appropriate to both the classroom and the gymnasium. The OSIA-IV is a comprehensive system for analyzing instruction when instruction is defined as "the process of arranging human, material and temporal resources with the

intention of facilitating the learning of self and/or others (Hough, et. al., 1975, Paper No. 1, p.4.)" After an exhaustive review of the literature in both education and physical education, Olson (1978) reported that the OSIA-IV was so designed to include nearly all of the categories and constructs contained in the myriad of observation instruments which had been reported in the physical education literature. The only major observation variable commonly employed in the gymnasium which is not directly coded in OSIA-IV is that of teacher feedback for student performance in motor activity.

Besides its comprehensiveness and adaptability to the physical education setting, OSIA-IV also has the following characteristics which make it an extremely desirable tool for research on teaching:

1. The system is non-evaluative.
2. It has a sophisticated, readily available program for data analysis that is compatible with most computer systems.
3. The system is flexible. It allows data from different category levels to be examined in single constructs, in patterns, or in multi-stage chains. (Olson, 1978, p. 8)
4. It meets the criteria for a fully faceted observation system recommended by Duncan and Biddle (1974).

METHOD

The OSIA-IV contains seven major dimensions. Since a comparison of teacher behaviors for physical education teachers (PETs) and classroom teachers (CTs) was desired, the dimension entitled "Instructional Functions" was selected for analysis in this

study. Four behavioral categories of Instructional Functions can be recorded with OSIA-IV: (1) Substantive behavior, (2) Appraisal Behavior, (3) Managerial Behavior, and (4) Instructionally Nonfunctional Behavior. The definitions for each of these categories are given below:

--Substantive behavior: behavior that is directly associated with achieving learning outcomes considered by those in the instructional situation to be a legitimate part of the subject matter of the field under study.

--Appraisal Behavior: behavior that judges or acknowledges a person, a behavior, or a product of a person's behavior who is a member of the instructional situation.

--Managerial behavior: behavior that is directly associated with creating the nonsubstantive conditions that are considered by those in the instructional situation to help influence the achievement of learning outcomes.

--Instructionally Non-Functional Behaviors: behavior that clearly or apparently interferes with either the creation of nonsubstantive conditions for learning or with the achievement of learning outcomes and/or serve no apparent substantive, managerial or appraisal instructional functions (Hough, Duncan, and Belland, 1975)

In addition to examining these four major classes of behavior subsumed under the generic title Instructional Functions, six subcategories of substantive and managerial behaviors were examined to

to determine if physical education and classroom teachers differed with regard to these more discrete behaviors. The definitions for these subcategories are given below.

--Sensing (Monitoring): any non-appraisal behavior in which a person uses one's senses (seeing, hearing, feeling, tasting, smelling) to take information from an external source. The behavior is essentially one of being in sensory contact with one's external environment.

--Manipulating Artifacts: any nonappraisal behavior in which one manipulates instructional aftifacts (works with) curricular-instructional materials.

--Initiation: Any spoken, unspoken or mediated nonappraisal behavior that presents substantive or managerial information to another or others. The initiating behavior may be an expression of knowledge and/or an expression of feeling states or value preferences.

--Responding: Any spoken, unspoken or mediated behavior that responds substantively or managerially to an element in the instructional situation. The responding behavior may be an expression of a feeling state or value preference.

--Soliciting clarification (Clarifying): "Any manifest nonappraisal behavior, spoken, unspoken, or mediated, that evokes or is intended to evoke from another person the fuller meaning of an antecedent behavior of that other person or a product of his behavior. The antecedent behavior may have involved expression

of feeling states or value preferences and/or expressions through motor behavior...(it) may be in the form of a question, direction or suggestion."

--Soliciting: any manifest nonappraisal behavior, spoken unspoken or mediated, that evokes or is clearly intended to evoke substantive and/or managerial behavior from another person in the instructional situation.

Subjects

The study was conceived as a preliminary investigation designed to identify fruitful questions for more intensive study. Consequently, a decision was made to obtain a wide spectrum of behavioral data on a limited number of subjects at a single school level. Thus, three physical education teachers and three classroom teachers were subject to intensive observation in their secondary classes. All teachers voluntarily agreed to participate. Brief descriptions of each of the secondary teachers observed are given below.

PE Teachers

#1--white female; approximately 30 years old, employed in a rural high school, observed in 10th grade coed volleyball

#2--black male, approximately 35 years old, employed in a large city high school: observed in 10th grade coed gymnastics.

#3--white male, approximately 30 years old, employed in a large suburban junior high school; observed in eighth grade coed gymnastics.

Classroom Teachers

#1--white male, 28 years old, small rural high school, observed in senior English

#2--white female, 28 years old, employed in a small rural high school, observed in freshman general biology

#3--white male, approximately 28 years old, employed in a small suburban high school, observed in senior government.

Coding Procedures

While coding with OSIA-IV can be done either live or from video tapes, a decision was made to directly code data from live classrooms because of the difficulties associated with obtaining audio-visual tapes of adequate quality in physical education settings. Sophisticated and expensive wireless microphone audio recordings of physical education classes are typically unreliable in the face of poor acoustics and rapid subject movement, while even split screen video technology fails to accommodate the spatial dimensions of the average gymnasium.

Observation of all teachers was performed by one of the investigators. The observer had received over 40 hours of training with the OSIA-IV system and had achieved consistent re. liability of .75-.95, coding to a pre-established standard during 10 coding sessions.

Analysis

The coding format for OSIA-IV allows events to be coded continuously at fixed five second intervals. This format provides both a frequency count and an approximation of time expended for each event. Since the physical education and classroom teaching lessons observed varied in their duration, all data were converted to percentages of total events and time so cross-class comparisons could be made. The average number of events and time in each category also were calculated as the basis for other comparisons of teacher behavior in the two settings. Rates of behavior were determined by considering the number of events/unit of time.

Table I

INSTRUCTIONAL FUNCTIONS OF SECONDARY PHYSICAL EDUCATION AND CLASSROOM TEACHERS

PETs	Substantive		Managerial		Appraisals		Non Functional		Total	Total
	%E	%T	%E	%T	%E	%T	%E	%T	E	T
I	73%	75%	17%	19%	1%	4%	1%	2%	102	1255 sec
II	80%	85%	5%	4%	15%	11%	0%	0%	117	785 sec
III	79%	82%	8%	9%	13%	9%	0%	0%	116	1060 sec
X%	77.3%	80.6%	10%	10.6%	9.6%	8%	.3%	.6%		
X#s	87	823.3 sec.	10.6	121.6	13.6	78.3 sec.	.3	10 sec.	111.6	1033.3

CTs

I	79%	91%	11%	4%	9%	2%	2%	2%	57	1095
II	71%									
II	71%	81%	7%	4%	22%	15%	0%	0%	119	1020
III	100%	100%	0%	0%	0%	0%	0%	0%	11	1000
X%	83.3%	90.6%	6%	2.6%	10.3%	5.6%	.6%	.6%		
X#s	47	938.3 sec.	4.6	31.6	10.3	58.3 sec.	.3	10 sec.	62.3	1038.3

E = Events
T = Time

Table II

ANALYSIS OF SUBSTANTIVE EVENTS AND TIME BY SUB-CATEGORIES

PETs	Monitor		Manipulate		Initiate		Respond		Clarify		Solicit		E	T
	%E	%T	%E	%T	%E	%T	%E	%T	%E	%T	%E	%T		
I	48%	55% 79%*	0%	0%	16%	4.5% 6%	14%	2% 3%	3%	1% 1%	19%	17% 10%	64	870 sec.
II	16%	8% 15%	3%	7% 13%	16%	10% 19%	10%	5% 9%	0%	0%	55%	24% 44%	58	430 sec.
III	31%	28% 40%	2%	.4% 1%	10%	12% 17%	36%	14.5% 23%	0%	0%	21%	13.5% 19%	61	745 sec.
X%	31.6%	30.3% 44.7	1.6%	2.5% 4.6	14%	22.3% 14	20%	7.2% 11.6	1%	.3% .3	31.6%	18.2% 24.3		
X#	19.6	350	1	20 sec	8.3	88.3 sec	12.3	81.6 sec	.6	3.3	19	38.3 sec		
CTs														
I	28%	27% 39%		.5% 1%	19%	47% 57%	25%	4% 5%	5%	1% 2%	19%	2.6% 4%	36	990 sec
II	4%	2% 4%		0%	37%	29% 63%	2%	0% 1%	6%	1% 3%	52%	14% 29%	54	480
III	0%	0%		0%	56%	97% 97	0%	0%	0	0%	44%	2% 2	9	930
X%	10.7%	9.7% 14.3		.2 .3	37.3%	57.6% 72/3	9%	1.3% 5	3.7%	.6 1.	38.3%	6.2% 11.7%		
X#	4	115		1.6	10.6	591.6		16.6	1.6	10	13	65 sec		

E = Events
T = Time

Table III

ANALYSIS OF MANAGERIAL EVENTS AND TIME BY SUB-CATEGORIES

PETs	Monitor		Manipulate		Initiate		Respond		Clarify		Solicit		E	T
	%E	%T	%E	%T	%E	%T	%E	%T	%E	%T	%E	%T		
I	0%	0%	8%	23%	15%	14%	0%	0%	8%	2%	69%	60%	13	215
II	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	100%	3	15
III	0%	0%	67%	89%	0%	0%	33%	11%	0%	0%	0%	0%	3	45
X%	0%	0%	25%	37.3%	5%	4.6%	11%	2.6%	2.6	.69	56.3%	53.3%		
X#	0	0	1	30 sec.	.6	10 sec	.3	2 sec	.3	2 sec.	4	48.3	6.3	91.6
CTs														
I	0%	0%	20%	11%	60%	78%	0%	0%	0%	0%	20%	11%	5	45
II	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	100%	7	40
III	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
X%	0	0	6.6%	3.6%	20%	26%	0%	0%	0%	0%	40%	37%		
X#	0	0	1	2	1	12	0	0	0	0	2.6	15 sec.	4	28.3

E = Events
T = Time

Discussion

Table I Instructional Functions

Substantive Functions--Time. The average total time spent by PETs and CTs was similar (PETs $\bar{X}$# of seconds = 1033.3; CTs $\bar{X}$# of seconds = 1038.3). This is an expected finding given the uniformity of time periods from one school to another, and from one class to another within secondary schools. However, the percentage of time spent in substantive functions varied by 10% PETs $\bar{X}$% = 80.6; CTs $\bar{X}$% = 90.6). Given the fact that a classroom teacher works within a relatively more stable physical environment, the lower percentage of time spent in substantive functions by PETs was not unexpected. Movement of equipment, of students, and from one area to another in physical education classes takes time. This reduces the amount of time available for the achievement of learning outcomes.

Substantive Functions--Events. The average number of substantive events emitted by PETs was nearly twice that number emitted by CTs (PETs $\bar{X}$# = 87; CTs $\bar{X}$# = 47). Given that these events occurred in 10% less substantive time for the PETs, it appears that PETs may emit instructional acts at a much more rapid rate than their classroom counterparts. This may provide one explanation for the high fatigue levels which characterize teaching in physical education. This finding certainly warrents further investigation, for if it is found to be generally true, it would provide a sound argument for reconsidering class loads in physical education, and for providing more realistic practice in the instructional pace at which teachers in training are expected to perform.

Managerial Functions--Time. PETs spent an average of 121.6 seconds or 10.6% of their time engaged in managerial functions, while CTs averaged 31.6 seconds or 2.6% of their time in managerial functions. Thus approximately four times as much time was spent in managerial functions by PETs as CTs.

Managerial Functions—Events. The number of managerial events emitted by PETs was approximately twice that of CTs (PETs $\bar{X}$# = 10.6; CTs $\bar{X}$# = 4.6). One can therefore conclude that PETs not only spent more time in managerial functions than CTs, but also that the duration of each managerial event was longer in physical education. Again this finding was not unexpected. The complexity of moving equipment and students through the relatively large instructional environment in physical education classes demands more time in simple logistics. What this finding suggests is that managerial functions must be given adequate coverage in teacher training programs. Students in physical education classes must learn to deal efficiently with these necessary functions if substantive time is not to suffer.

Appraisals--Time. The amount and percent of time spent in appraisal behavior by PETs and CTs was similar, though PETs spent slightly more time in appraisal than did CTs (PETs $\bar{X}$% = 8, $\bar{X}$ of 78.3 seconds; CTs $\bar{X}$% = 5.6, $\bar{X}$ of 58.3 seconds).

Appraisals--Events. The number of appraisal events emitted by PETs and CTs was approximately equal (PETs $\bar{X}$# = 13.6; CTs $\bar{X}$# = 10.3) One would have expected both the amount of time and the number of appraisal events emitted by PETs to be higher since, in theory, physical education students are practicing much of the class time. The expectation is that PETs

provide relatively continuous evaluation feedback to students. On the other hand, CTs often do not engage their students actively during lecture or seatwork. Since appraisal in physical education is logically linked to monitoring, this finding is discussed further in the section dealing with teacher monitoring.

Non-functional--Time and Events. Nonfunctional behavior of class room and physical education teachers was virtually identical in actual time, percentages of time and number of events. In both cases, nonfunctional behavior was almost non-existant.

Table III Analysis of Substantive Time and Events

Monitoring--Time. Of the total amount of substantive time, PETs spent 44.7% or an average 350 seconds engaged in monitoring activities, while classroom teachers spent 14.3% or an average 115 seconds engaged in monitoring behavior. Thus PETs spent approximately three times as much time in monitoring activities as the CTs.

Monitoring--Events. PETs engaged in an average of 19.6 monitoring events, while CTs engaged in an average of 4 monitoring events. Thus PETs emitted approximately four times as many monitoring behaviors as CTs. Again, the number of events per measure of time is somewhat greater for PETs. Since monitoring of student performance is necessary for the provision of evaluative performance feedback to students during practice, the finding that PETs engage in considerably more monitoring behavior than CTs was expected. What was not expected was the comparatively small amount of appraisal behavior of PETs which accompanied the monitoring behavior. One speculation regarding the small amount of appraisal behavior is that monitoring time may be used by teachers to "rest". Given the rapid pace of

instructional events in physical education classes, one could understand the teachers' need for a mental break. Or it may be that the teachers were monitoring the lesson for other reasons (e.g., to insure a safe practice environment, to think ahead about what would occur next in the lesson.) The findings certainly deserve more investigation before conclusions can be drawn.

Manipulating--Time Events. The small differences between physical education and classroom teachers in this category do not appear to have practical significance.

Initiating--Time. PETs spent considerably less time initiating with their students than did CTs (PETs $\bar{X}\%$ = 14, $\bar{X}\#$ = 88.3 seconds; CTs $\bar{X}\%$ = 72.3, $\bar{X}\#$ = 591.6 seconds). In fact, CTs spent approximately six times as much time in initiation as PETs.

Initiation--Events. Despite the large differences in amount of time spent in initiation, PETs emitted an average of 10.6 initiating events. Thus the number of initiating events displayed by classroom and physical education teachers was not greatly different. One explanation for this anomaly might be found in the nature of communication patterns in the two environments. Verbal explanations which one might suspect are used more frequently in the classrooms may tend to take much longer than nonverbal explanations (demonstrations), which can convey a great deal of information in a short period of time. Another possible explanation for the shorter amount of time spent by PETs in initiation might be that they are simply more efficient at this function. We have already seen that PETs emitted twice as many behaviors in the substantive category overall as CTs, and that they did this in 10% less time.

Responding--Time. PETs spent 11.6% of their substantive time or an average of 81.6 seconds responding to students, while CTs spent 5% or an average of 16.6 seconds responding to students. In terms of actual time (seconds) PETs spent about 5 times as much time responding to students as CTs.

Responding--Events. PETs emitted an average of 12.3 responding behaviors to an average of 3.3 responding behaviors exhibited by CTs, or approximately 4 times as many responding behaviors. Thus PETs are spending about 4 times as many responding behaviors as CTs. Per unit of time, classroom and physical education teachers are behaving at the same rate with regard to responding. Given the level of active involvement of physical education students it is not unexpected that PETs find many more student behaviors which require responses.

Clarifying--Time and Events. The amount of time and event differences in teacher clarification appear to have no practical significance.

Soliciting--Time. PETs spent an average of 24.3% of their substantive time or an average of 138.3 seconds in solicitation versus 11.7% and 65 seconds for CTs. Approximately twice as much time was used for solicitation in physical education.

Solicitation--Events. PETs emitted an average of 19 solicitations to 13 for CTs. Since the number of solicitations was lower/unit of time, PETs were emitting this behavior at a slightly lower rate than CTs.

The fact that PETs engaged in more soliciting, monitoring and responding than CTs probably reflects the more active nature of physical education classes. On the other hand, CTs engaged in considerably more initiating or presenting behavior, and this seems to be consistent with the more teacher centered nature of classroom instruction.

Table IV Managerial Functions

Although PETs spent more time in managerial functions than CTs, an analysis of the sub-categories did not reveal any findings of note. A larger sample of teachers, may reveal differences which were not noted in this study.

Figure 1

DIFFERENCES BETWEEN CLASSROOM AND PHYSICAL EDUCATION TEACHERS OF INSTRUCTIONAL FUNCTIONS

PRACTICAL DIFFERENCES	NO PRACTICAL DIFFERENCES
Instructional Functions:	Instructional Functions:
Substantive--PETs emitted 2X as many events as CTs PETs rate of behavior was 2X as great as CTs PETs spent 10% less time in substantive functions as CTs	Substantive--
Managerial-- PETs spent 4X as much time in managerial functions as CTs PETs emitted 2X as many managerial events as CTs PETs rate of behavior for managerial functions was 2X as great as CTs	Managerial--
Appraisal--	Appraisal-- no practical differences
Non-Functional--	Non-Functional--no apparent differences almost non-existant for both
Substantive Breakdown	Substantive Breakdown
Monitoring-- PETs spent 3X as much time as CTs PETs had 4X as many events as CTs PETs had a slightly higher rate of monitoring than CTs	Monitoring
Manipulating--	Manipulating-- no practical differences
Initiating-- CTs spent 6X as much time as PETs CTs rate of initiating was considerably lower than PETs	Initiating--
Responding-- PETs spent 5X as much time as CTs PETs emitted 4X as many events as CTs	Responding-- rate of responding was approximately the same for PETs and CTs
Clarifying--	
Soliciting-- PETs spent 2X as much time as CTs PETs emitted 1½X as many events PETs rate of behavior was slightly lower	Soliciting--
Managerial Breakdown	No practical differences in managerial behavior of PETs and CTs were apparent

SUMMARY OF FINDINGS

Figure 1 summarizes the general findings of the study. The findings for each analysis are given below for rates of behavior, time, and events.

Rates of Behavior: With regard to the overall analysis of data, the results indicate that PETs behave at twice the rate of CTs in substantive and managerial functions. No practical differences appeared for appraisal and non-functional categories. When the substantive category was broken down into subcategories for further analysis, the data reveal that PETs showed higher rates of monitoring and initiating behavior, lower rates of solicitating behavior, and approximately the same rates of behavior for manipulating, responding, and clarifying behaviors.

Time: Total time for PETs and CTs was almost identical. With regard to the overall analysis of data, PETs spent more time managing and slightly less time in substantive matters than CTs. No practical differences between Appraisal and Non-functional categories were apparent. When substantive time was analyzed in terms of sub-categories results showed that PETs spent considerably more time in monitoring, responding, and soliciting categories, and considerably less time in initiating category. No practical differences were apparent for Manipulating or Clarifying categories.

Events: With regard to the overall analysis of data, the results indicate that PETs emitted considerably more substantive and managerial events than CTs. No apparent practical differences existed for Appraisal and Non-Functional categories. When substantive category

was analyzed by subcategories, results showed that PETs emitted more monitoring, responding, and eliciting events, fewer initiating events, and about the same number of manipulating and clarifying events.

Implications

Results from this preliminary study indicate that OSIA-IV can be an extremely valuable research tool for comparing teaching functions in different instructional settings. The large differences found for some physical education and classroom teachers' behaviors indicate that further research might provide information of theoretical and practical importance. If the results are corroborated, data rather than opinion would provide the basis for a critical reappraisal of teaching in physical education. If the temporal and substantive differences in teaching physical education are consistent with recommendations for implementation in the physical education environment and their programmatic or instructional goals, then there would be some immediate implications for the organization and conduct of teaching training programs in physical education. Practical applications in school setting could also be made.

References

Duncan, M. J., & Biddle, B. J. The Study of Teaching. New York: Holt, Rinehart, & Winston, Inc., 1974.

Hough, J., Duncan, J., & Belland, J. What is Instruction. Unpublished paper. The Ohio State University, 1975.

Olson, J. Adaptation of the observational system for instructional analysis (O.S.I.A.) for use in physical education. Unpublished doctoral dissertation, The Ohio State University, 1979.

Rink, J. Development of a system for the observation of content development in physical education. Unpublished doctoral dissertation, The Ohio State University, 1979.